

(10) Patent No.: US 6,618,469 B2
(45) Date of Patent: Sep. 9, 2003

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(57) **ABSTRACT**

(51) **Int. Cl.⁷** **H04M 1/24**

(52) **U.S. Cl.** **379/1.01; 379/1.03; 379/1.04;**

379/24; 379/21; 379/27.01; 379/29.05;
379/30

(58) **Field of Search** 379/22.04, 10.01,
379/24, 21, 22.03, 22.05, 27.01, 29.05,
30, 1.01, 1.03, 1.04, 3, 22, 22.01, 22.02,
22.07, 26.01, 27.03, 27.04, 29.1, 29.11





US006617941B2

(12) **United States Patent**
Heumann

(10) **Patent No.:** **US 6,617,941 B2**
(45) **Date of Patent:** **Sep. 9, 2003**

(54) **METHOD FOR DESIGNING A FILTER SYSTEM**

(58) **Field of Search** 333/167, 172,
333/175, 177, 181, 185; 307/105

(75) **Inventor:** Dirk Heumann, Nidderau (DE)

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(*) **Notice:** Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

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WO WO 0028660 5/2000 H03H/7/06

(21) **Appl. No.:** 09/913,699

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(22) **PCT Filed:** Dec. 19, 2000

(86) **PCT No.:** PCT/EP00/12959

§ 371 (c)(1),
(2), (4) **Date:** Jan. 2, 2002

(87) **PCT Pub. No.:** WO01/47107

PCT Pub. Date: Jun. 28, 2001

(65) **Prior Publication Data**

US 2003/0011445 A1 Jan. 16, 2003

(30) **Foreign Application Priority Data**

Dec. 20, 1999 (DE) 199 61 535

(51) **Int. Cl.⁷** H03H 7/09; H03H 7/06

(52) **U.S. Cl.** 333/167; 333/172

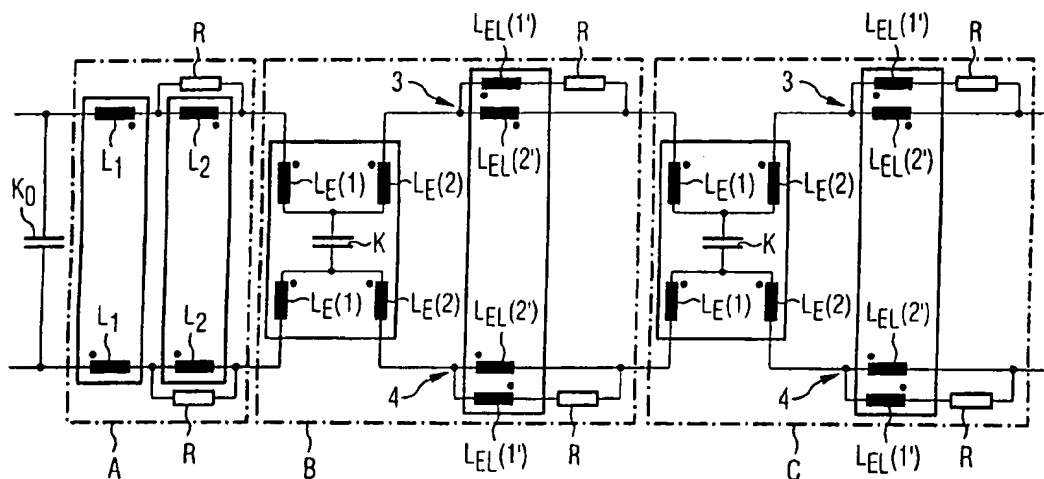
Primary Examiner—Seungsook Ham

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(57) **ABSTRACT**

A filter system includes at least two longitudinal branches with longitudinal inductors and at least one filter section (B) and an adjacent filter section (A). The filter section (B) is provided with at least one transverse branch that is interposed between the longitudinal branches, the adjacent filter section (A) adjoining the transverse branch. The number of inductors of a filter section that are wound around different magnet cores can be reduced by equivalence transformation.

25 Claims, 8 Drawing Sheets





US006552630B2

(12) **United States Patent**
Chueh et al.

(10) **Patent No.:** **US 6,552,630 B2**
(45) **Date of Patent:** **Apr. 22, 2003**

(54) **BI-DIRECTIONAL LOW-PASS FILTER FOR
USE AT USER END OR OFFICE END IN
COMMUNICATION NETWORK**

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(73) **Assignee:** **Primax Electronics Ltd., Taipei (TW)**

WO WO-200028660 A1 * 5/2000

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patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

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(21) **Appl. No.:** **09/997,700**

Primary Examiner—Seungsook Ham

(22) **Filed:** **Nov. 29, 2001**

(74) **Attorney, Agent, or Firm—Mathews, Collins,
Shepherd & McKay, P.A.**

(65) **Prior Publication Data**

US 2003/0006860 A1 Jan. 9, 2003

(57) **ABSTRACT**

(30) **Foreign Application Priority Data**

Jul. 9, 2001 (TW) 90116761 A
Aug. 10, 2001 (TW) 90116761A01

(51) **Int. Cl.⁷** **H03H 7/06**

(52) **U.S. Cl.** **333/172; 333/177; 333/181;
379/399.01**

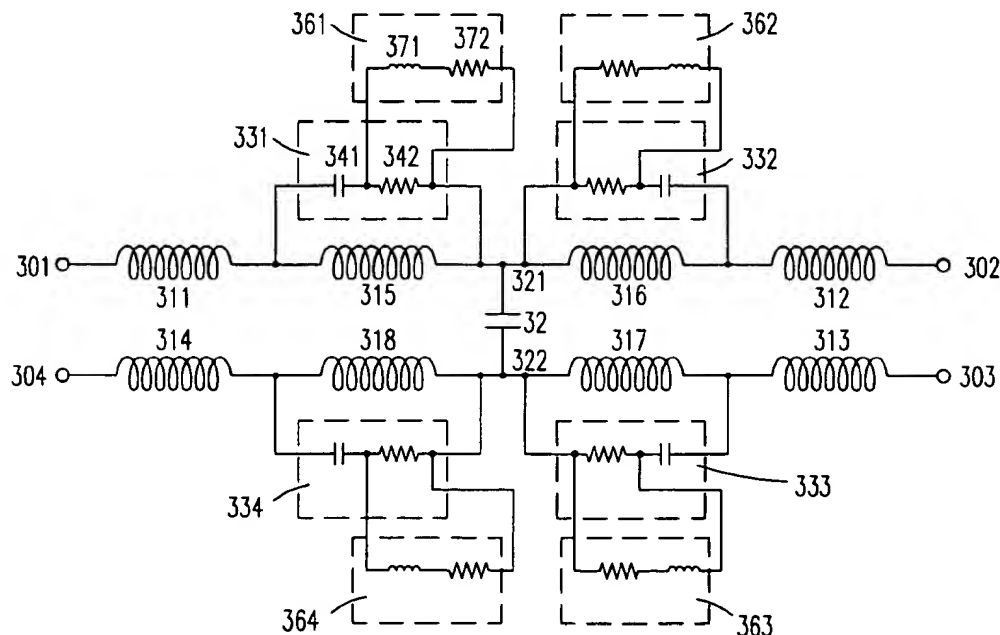
(58) **Field of Search** **333/172, 175,
333/176, 177, 181, 185; 379/399.01, 398**

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9 Claims, 5 Drawing Sheets





US006285754B1

(12) **United States Patent**
Sun et al.

(10) **Patent No.:** **US 6,285,754 B1**
(45) **Date of Patent:** ***Sep. 4, 2001**

(54) **ODD-ORDER LOW-PASS POTS DEVICE
MICROFILTER**

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(*) **Notice:** Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

—This patent is subject to a terminal dis-
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Assistant Examiner—Ramnandan Singh

(74) *Attorney, Agent, or Firm*—Carr & Ferrell LLP

(57) **ABSTRACT**

An odd-order low-pass microfilter is disclosed for being
interposed between a home telephone wiring network and a
POTS, or voice-band, device to separate voice-band signals
from higher frequency signals, such as ADSL signals and
home networking signals. The filter topology is substantially
symmetric so that the filter is reversible in that either end of
the filter may be directly coupled to the home telephone
wiring network without impairing high frequency signal
performance or the filter characteristic of the filter. In one
embodiment, the filter is a three-pole filter with a single
capacitor disposed between a pair of coupled inductors.
Each of the coupled inductors advantageously has an inter-
winding capacitance over about 100 pF to improve the filter
frequency response without increasing the cost of the filter.
In another embodiment, the filter is a reversible three-pole
filter with a single capacitor disposed between first and
second pairs of uncoupled, or discrete, inductors.

10 Claims, 10 Drawing Sheets

(21) **Appl. No.:** **09/544,731**

(22) **Filed:** **Apr. 6, 2000**

(51) **Int. Cl.**⁷ **H04M 1/100; H04M 11/06;
H04B 1/38**

(52) **U.S. Cl.** **379/399; 375/220; 375/259;
375/219; 370/494; 370/493; 370/495**

(58) **Field of Search** **379/399, 419,
379/389, 397, 93.07, 93.1; 370/494, 493,
495; 375/220, 259, 219**

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